SF/AR 4.1.5

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

Reply To
Attn Of: OEA-095

September 9, 2004

MEMORANDUM

TO: D. Wayne Berman, President, Aeolus, Inc.

FROM: Julie Wroble, Office of Environmental Assessment, Risk Evaluation Unit

CC: Dan Heister, On-Scene Coordinator, Environmental Cleanup Unit
Alan Goodman, Remedial Project Manager, Environmental Cleanup Unit
Dr. Pat Cirone, Unit Manager, Office of Environmental Assessment, Risk Evaluation Unit
Dr. Aparna Koppikar, National Center for Environmental Assessment
Richard Troast, Office of Solid Waste and Emergency Response

SUBJECT: Comments on the Final Draft Soil Sampling Results and Preliminary Risk Assessment for the North Ridge Estates Site, Klamath Falls, Oregon (July 6, 2004)

Overview

Attached please find my comments on the above-referenced document. Note that this document is the third and final draft and is much improved over the previous two versions (November 21, 2003, and March 23, 2004). Most of the comments I made on earlier drafts and data that EPA collected at residential properties within the North Ridge Estates (NRE) site have been incorporated. I am inclined to accept this version of the soil data report, recognizing that it represents risks associated with specific activities that disturb soil. Also note that EPA has completed task-based monitoring at the NRE site and this data could be used to refine the modeling performed within this document or to supplement the data set evaluated in this report.

> **RESPONSE:** I have already developed and am currently finalizing a supplemental report on the simulation (task-based monitoring) data reported by EPA. The report includes a comparison between the results of the task-based monitoring and the exposure/risk-modeling results presented in the soil report.

Ultimately, a risk assessment that incorporates air, soil, and dust data for the site should be completed to present overall risks to the residents at NRE.

> **RESPONSE.** The components of this overall risk assessment have been presented in a series of reports, which are each being revised and finalized. Production of a final, integrated report is also envisioned.

Given the above considerations, this document likely will be considered by EPA risk managers along with the other relevant data and reports, in deciding how to proceed with investigating and remediating the NRE site. Another issue that needs to be discussed within EPA is the discrepancy between EPA's "acceptable" risk range and Oregon DEQ's soil cleanup rules, which state that individual carcinogens in soil must be cleaned up to a level posing no greater than a 1 x 10-6 excess lifetime cancer risk (OAR 340-122-045).

Please contact me at 206/553-1079 if you have specific questions on these comments.

Specific Comments
Page 1, Executive Summary (editorial): ACM should be defined as asbestos-containing material. Preliminary Assessment refers to something fairly specific within EPA, this report consists of a preliminary or focused risk assessment for the NRE soil data set.

> **RESPONSE.** The definition of ACM and the relationship between ACM and debris has been described in a footnote at the beginning of the executive summary. Also, the text of the document has been modified to indicate that it represents a "preliminary risk assessment."

Page 5, 3rd full paragraph: In the fifth sentence, add "area-wide" before "surface samples."

> **RESPONSE.** Done.

Page 26, 2nd full paragraph: Regarding the private communcation from Wroble, Janice Panichello may be able to provide maps that show where earlier cleanups have been performed relative to the current sample locations *(note, I am trying to get a reference for this).* Also, later in this paragraph, change "clearly have not been cleaned" to "may not have been cleaned within the past few years."

> **RESPONSE.** I have now referenced the map that is included as Appendix C in the Administrative Order of Consent. Also, made change to paragraph as suggested.

Page 41, length of road calculation: Please provide additional clarification to the equation. What does the term 1.4.1 represent?

> **RESPONSE.** See clarifying sentence at the end of the paragraph.

Page 47, Section 5.3.4.1, 2nd paragraph: Regarding private communication referenced, it might be better to reference a memo or e-mail from Dan Heister, the project On-Scene Coordinator, regarding resurfacing material at the site.

> **RESPONSE.** I have now referenced a memorandum from Judy Smith.

Page 48, 4th full paragraph: This paragraph implies that construction will only occur where surficial ACM has been removed; however, the undeveloped properties at the site have not had any surficial cleanup performed yet. Therefore, future construction is more likely to occur on properties where little if any remediation has been completed.

> **REFERENCE.** The intention of the paragraph is to indicate that commercial construction, if it is to last as long as supposed, will have to be conducted over an extensive area that is much larger than the sizes of hot spots that have been identified on the site. For example, the activities that are likely to generate dust from site soil during construction of a single house on a single parcel will not likely last (in total) for more than a few weeks (although, because it may not be conducted continuously, the calender time may be much longer). Therefore, dust generating activities associated with construction that last as long as a year will need to be conducted over very large areas or a set of non-contiguous areas that add up to a very large area.
>
> Moreover, it is important to remember that the composite samples collected at the site were intentionally collected *prior* to the cleanup that was conducted last year. This was the reason that the initial sampling campaign was so rushed; it had to be completed prior to the start of the

cleanup. In fact, at least some of the components of the composite samples were even collected from the undeveloped parcels that are mentioned in the question (even though such parcels were not included in the cleanup itself). This is because the sampling campaign was spread out over the *entire* North Ridge Estates Site (see the sample location map, Figure A-1). Thus, the composite samples do *not* represent areas that necessarily have been surficially cleaned up.

– But may based on Mdot...

Especially considering that contributions from the ACM present in the composite samples are included in the source term for this pathway, it is reasonable to conclude that this source term is a conservative representation of conditions over large areas of the site both because so much of the surface of the site has now been cleaned up and, more importantly, because total contributions from ACM will not be realized until the ACM completely degrades, which will not occur any time soon.

surficial removal ≠ cleanup

Page 56, 1st paragraph under Walking, Running, and Bicycling: In the last sentence, change "obtain" to "likely occur."

RESPONSE. Done. I am curious, however: does EPA commonly suggest style changes? If one looks up the word "obtains" in the dictionary, one will find that it also has an intransitive form that does not require an object. Thus, use of that word in the manner used in the referenced sentence is correct. In fact, I learned this style in graduate school. Regardless, I have made the requested change.

Page 57, first full paragraph, last sentence: Delete "and other regulators." The state of Oregon typically uses 1 x 10-6 as a point of departure for long-term cleanup decisions for individual carcinogens.

RESPONSE. Done. This change was incorporated throughout.

Page 58, 1st paragraph under Rototilling: In the last sentence, change "obtain" to "likely occur." In this paragraph the author comments that the concentrations modeled are upper-bound estimates for the site. How do you reconcile this with the activity-based monitoring data for rototilling which indicated somewhat higher concentrations?

RESPONSE. The indicated change has been incorporated. Regarding the question about concentration.....

As indicated above, I plan to address comparisons between the modeling effort and the results of the activity-based monitoring conducted by EPA as part of a "simulation report", which will be a supplement to this report. Regarding this question, however, until we understand and compare the manner in which both the activity-based monitoring is conservative with the manner in which the modeled estimates are conservative, indicating whether one concentration or the other is higher is not necessarily meaningful. At this point in time, for example, we have no idea how conservative the simulation measurements are likely to be. Thus, the question is premature.

The modeled estimates are intended as conservative estimates of long-term average exposures and risks potentially experienced by site residents. They will not necessarily be greater than all other *conservative* estimates that could conceivably be generated in almost any manner incorporating almost any degree of conservatism. This would not be appropriate, at least if they are to support reasonable decision making. This is why (as I stated in my comments concerning the original design of the simulations for this site, Berman 6/15/04) a much more sophisticated simulation is required, if we are to use the results to reasonably evaluate the modeling approach.

Importantly, given that multiple tools are employed to bound risks and that, due to differences in potential sources of uncertainties, the tools employed to bound risks from modeled estimates are different than the tools that are employed to bound risks from measured estimates, if one is attempting to evaluate health protectiveness (as opposed to other objectives), it is the ultimate risk estimates (rather than exposure concentrations) that should be compared. Even for a comparison of risks, however, one still needs to consider the relative degree with which measured and modeled estimates are intended to be conservative (i.e. one needs to consider what sources of uncertainties are intentionally addressed in each case).

To further elaborate on what is stated in the first paragraph above, if one is going to meaningfully compare concentration estimates, it is first necessary to quantify the similarities and differences in the input values and assumptions that are relevant to both the modeled and measured estimates, respectively. However, we do not yet know the values of all of the input parameters for the simulations and it is even possible that, given the design of the simulations, we may not be able to adequately characterize all of the relevant input parameters without further study.

Nevertheless, at least for rototilling, the modeled concentrations are about a factor of 30 *higher* than the measured concentrations. Moreover, due to introduction of additional, conservative factors, for rototilling, the modeled risks are more than 1,000 times greater than the risks derived from the monitoring data (when concentrations and risks are reported as protocol structures) and more than 150 times greater (when concentrations and risks are reported as 7402 structures). This will all be addressed in the pending simulation report

Page 60, 3rd paragraph: One concern that was raised at the public meeting held on July 7, 2004, is that many of the residents have been doing significant earth-moving activities themselves on their own properties for landscaping and construction purposes. How can the risk estimates be applied to these ongoing exposures?

RESPONSE. I think that these pathways can be adapted to adequately address the kinds of excavation and construction that residents have been doing. It would be helpful to better understand the nature of such activities and the duration and frequency of the actual dust generating components of the work so that these pathways can be adapted to evaluate exposures potentially experienced by the residents. Perhaps, residents might provide brief descriptions of the nature of some of these projects so that appropriate values for various parameters could be reasonably estimated. In fact, it would likely be most helpful to address these issues in the final, integrated risk assessment for the site.

At the same time, the estimates presented in the current report should be extrapolated only with extreme care. For example, even if a resident were to hire a bulldozer and were to maneuver themselves so that they remained constantly and continuously downwind in the immediate vicinity of the dozer while it worked (a highly unlikely prospect itself), it is unlikely that there would be sufficient material to excavate on a single property to achieve the mass rate of excavation assumed for this scenario in the current report. Thus, modeled results from this pathway would need to be substantially adjusted before they could be used to evaluate exposures experienced by residents in association with construction projects that they personally undertake.

Page 63, last sentence: Delete "and other regulators on a site-specific basis."

RESPONSE. This change was completed generically, throughout the document.

Page 64, first paragraph: Explain why the data set for amphiboles is not as conservative as for chrysotile.

RESPONSE. A detailed discussion of the limitations of the existing data set for evaluating amphibole asbestos is presented in Section 5.3.4.2 of the report and I have added a reference to that section in the paragraph on Page 64. As described in that section, briefly, the hot spots chosen to provide conservative estimates of concentration at the site were chosen in a manner appropriate for bounding chrysotile concentrations but not necessarily amphibole asbestos concentrations. The section also goes on to describe additional considerations incorporated into the risk assessment to mitigate this limitation.

Page 64, 2nd paragraph under Gardening and Children Playing in Soils: Delete "and other regulators on a site-specific basis."

RESPONSE. Done.

Page 65, 2nd paragraph under Rototilling" Delete "and other regulators on a site-specific basis."

RESPONSE. Done.

Page 66, Section 5.5.2.2, 2nd paragraph: Delete "and other regulators when site-specific considerations are addressed." Also, address how the risks to construction workers might relate to residents who perform similar earth-moving and construction activities on their own properties.

RESPONSE. The deletion is done. Regarding addressing risks to residents who perform earth-moving and construction activities, see my response to the comment on Page 60, 3rd paragraph (above).

Page 67, 3rd full paragraph: I have a similar concern about the statements made for construction workers and how risks for this receptor category might apply to residents performing similar activities on their own properties.

RESPONSE. Regarding addressing risks to residents who perform earth-moving and construction activities, see my response to the comment on "Page 60, 3rd paragraph" (above).

Page 67, Section 5.5.3: This section describes how risks may be summed for chrysotile and amphibole-related risks; however, no where in the risk assessment are risks summed across exposure pathways. For example, someone who gardens may also run. A discussion of risks across a combination of exposure pathways should be included.

RESPONSE. As indicated in the referenced section, it is not generally appropriate to sum conservative estimates. The appropriate approach is to sum best estimates and then to create upper bound estimates for the combined sum. Also as indicated in this section, summing across risk estimates will seldom change things even by as much as a factor of two. This is because the random chance that even two risk estimates will be of the same magnitude is very small. Thus, typically, one (or at most, two) risk estimates dominate so that summing across such estimates will not change the largest value by more than a factor of two.

The question regarding summing across exposure pathways has been explicitly addressed in Section 5.3.3 and a footnote has been added to the section referenced in this comment that points to Section 5.3.3. As indicated in that section, with the exception of rototilling and ATV riding (and a minor adjustment to time for running that is incorporated to address the issue of endurance), the duration and frequency estimates employed for each of the activities evaluated

represent a conservative upper bound estimate of the total time that people tend to spend outdoors. Therefore, it is entirely inappropriate to sum across these exposure pathways.

Moreover, regarding rototilling itself, as indicated in the response to the comment concerning "Page 58, the first paragraph under rototilling" (above), the results of the task-based monitoring conducted by EPA suggests that risk estimates for this pathway are likely over-estimated by two to three orders of magnitude (even without considering the degree to which the task-based monitoring itself may have been conservative). Given the nature of the assumptions employed for ATV riding, it is expected that the risk estimate for this pathway is similarly over-estimated. Thus, given that risk estimates for these two pathways are already highly likely to be over-estimated by a couple of orders of magnitude (or more), adding contributions from these pathways to estimates from any other pathway is not appropriate. Besides, as indicated above, such addition would only change the estimates by at most a factor of two, which is a very small effect compared to other factors that determine risk.

Page 68, Section 5.5.4, first paragraph: Delete "and other regulators when site-specific conditions are addressed."

RESPONSE. Done.

Page 70, 3rd bullet: Please comment on how moisture content measured during the July activity-based sampling event compares with the assumptions used in the modeling. I disagree that each of the bullets represent a scenario that is 90% more conservative of actual cases and I think no attempt should be made at this point to quantify the extent of that uncertainty. I recommend revising the first full paragraph on page 71 to remove this semi-quantitative, but very fuzzy, assessment of uncertainty.

RESPONSE. The relationship between the moisture content observed during the activity-based sampling event and the values that were assumed for the modeling will be addressed in the pending simulation report.

Regarding the latter part of this comment, there appears to be a misunderstanding between the intent of the discussion concerning the *probability* of a result being conservative versus the *magnitude of the degree* to which an estimate is conservative. For example, the report does *not* state that the scenarios are "90% more conservative of actual cases," (which implies that they are at least 10 times more conservative in magnitude). Rather, the report states that the estimates are "more conservative than 90% of cases," (which implies a probability of being conservative, not a magnitude). Thus, the paragraph on top of page 71 is intended to illustrate estimation of a probability that something is conservative, *not a magnitude.* Moreover, it is intended as an illustration, not a blanket statement of uncertainty for the entire document. Thus, specifically with regard to walking, running, or bicycling (as stated), I believe that the illustration is entirely appropriate. Nevertheless, given the degree of confusion that this illustration appears to be introducing, I will remove it.

Page 71, 3rd full paragraph: Please comment on the activity-based sampling results relative to the modeling. At the location where the activity-based sampling was conducted, the ACM was not completely degraded; however, air concentrations of asbestos upon disturbance were higher than what was modeled in this report.

RESPONSE. See the previous response to the comment about "Page 58, first paragraph" (above). These issues will be addressed in a pending simulation report. At this point in time, we still know neither the concentration of free asbestos in the soil where the simulations were conducted nor the values for several other parameters that potentially affect emission and dispersion.

Page 73, Section 6, first sentence: Add the word "risk" between "preliminary" and "assessment."

RESPONSE. Done.

Tables 19 and 20: Risks should be presented to one significant figure (e.g., 2.1E-04 should be 2E-04). Also, the footnote on Table 20 is in error. Please correct this.

RESPONSE. The formatting for risk estimates has been corrected. The footnotes have been corrected in Table 20. It should also be noted that an additional error found in Table 21 concerning the original lack of summing of risks across chrysotile and amphiboles for gardening, child's play, and the two combined has also been corrected.

Table 22: The footnotes have been truncated on my version of this table. Consider using gridlines or reformatting to make this more readable.

RESPONSE. This has been fixed.

Table C-1: Consider removing the assumptions for a child since these values were not used in the quantitative risk assessment.

RESPONSE. I think it is helpful to allow comparison of the adult and child scenarios. Therefore, rather than deleting the child scenarios from the table, text was added to the appendix indicating why only the adult scenarios were used in the risk assessment.

Appendix F, page 120, last paragraph: Add "Also, the degree to which these samples represent the range of concentrations at the other residences within NRE cannot be determined."

RESPONSE. I do not agree with the proposed sentence as written. It appears that the concern being expressed is that there may be less certainty extrapolating these results to residential lots not directly sampled than drawing conclusions from these results about the lots that were sampled. However, I believe that the last sentence of the referenced paragraph (as it currently stands): "...the degree to which this set of samples is positively biased cannot be determined from available information." is sufficiently broad to cover this concern so that adding an additional sentence would be redundant and is unnecessary.

Appendix F, Page 123, 4th paragraph: This paragraph is difficult to understand. Consider revising Table F-2 and this paragraph to add clarity.

RESPONSE. I have re-written this paragraph and the following paragraph to make them clearer.

Table F-1: Add footnote a.

RESPONSE. There is no footnote "a" for this table. There is simply a note at the bottom of the table indicating that the shaded rows highlight the samples in which amphibole asbestos structures were detected.

Table F-2: Add units to the Analytical Sensitivity column. Clarify how maximum UCL sturctures were determined. It is difficult to understand what data were used to generate these UCLs.

RESPONSE. Units have been added. A footnote has been added to clarify the origin of the UCL's.